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(54) **METHODS AND APPARATUS FOR
OBTAINING CONTENT WITH REDUCED
ACCESS TIMES**

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CPC **G06F 17/30899** (2013.01); **H04L 1/08**
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67/02 (2013.01)

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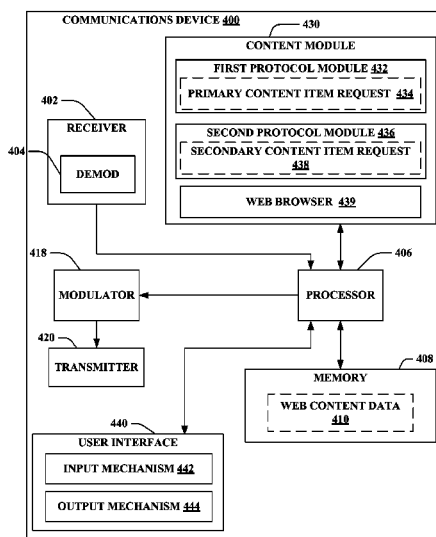
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(57) **ABSTRACT**

A method and apparatus for obtaining content with reduces
round trip times is provided. The method may comprise trans-
mitting, from a device, a primary content item request to a
proxy server to obtain a primary content item using a first
protocol, receiving the primary content item from the remote
proxy using the first protocol, generating one or more sec-
ondary content item requests for one or more secondary con-
tent items associated with the primary content item, transmit-
ting the one or more secondary content item requests to the
proxy server using a second protocol, wherein the second
protocol decouples the one or more secondary content item
requests from an acknowledgement of receipt of the one or
more secondary content item requests, and receiving at least
one of the one or more secondary content items from the
proxy server using the second protocol.

32 Claims, 7 Drawing Sheets



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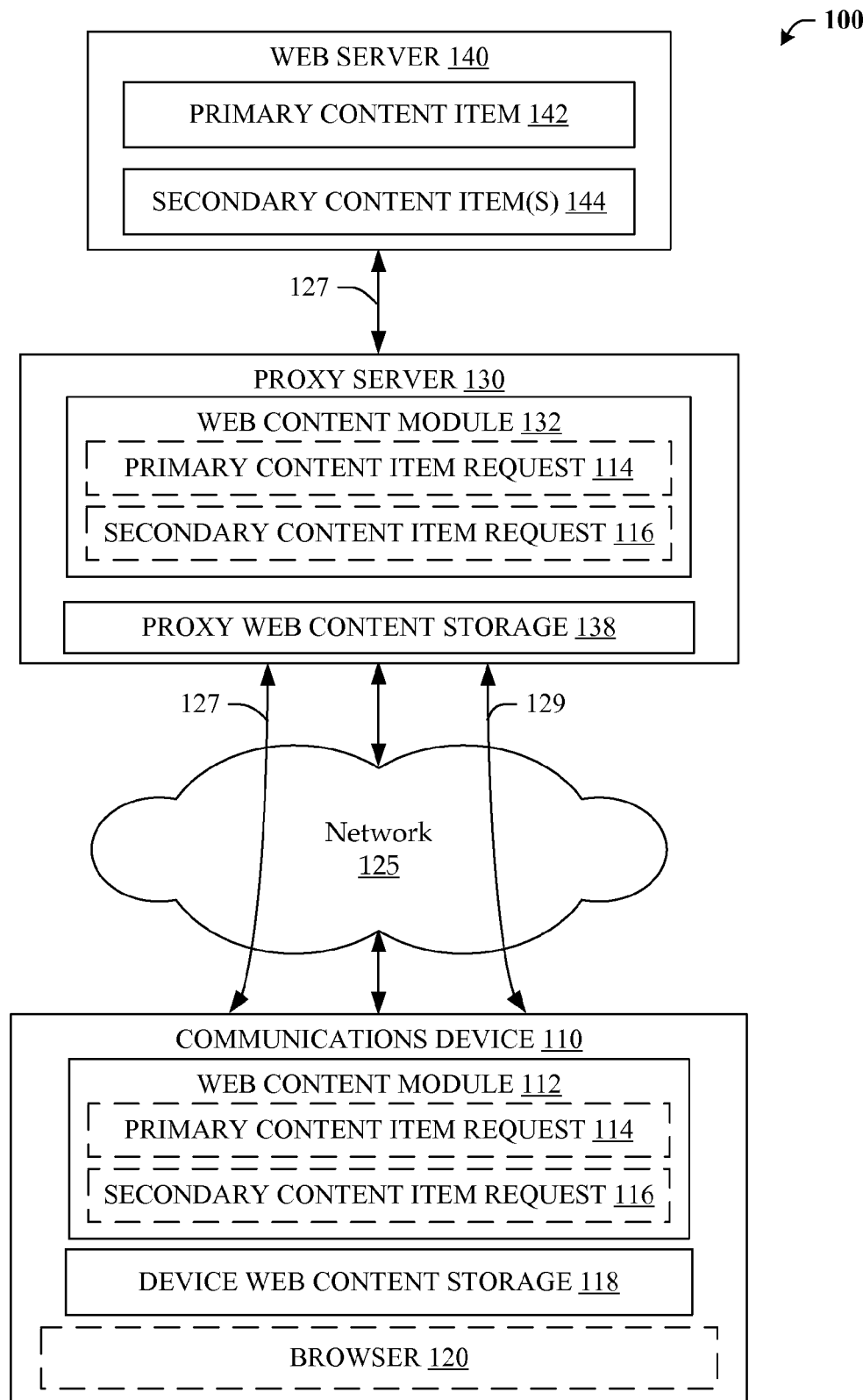
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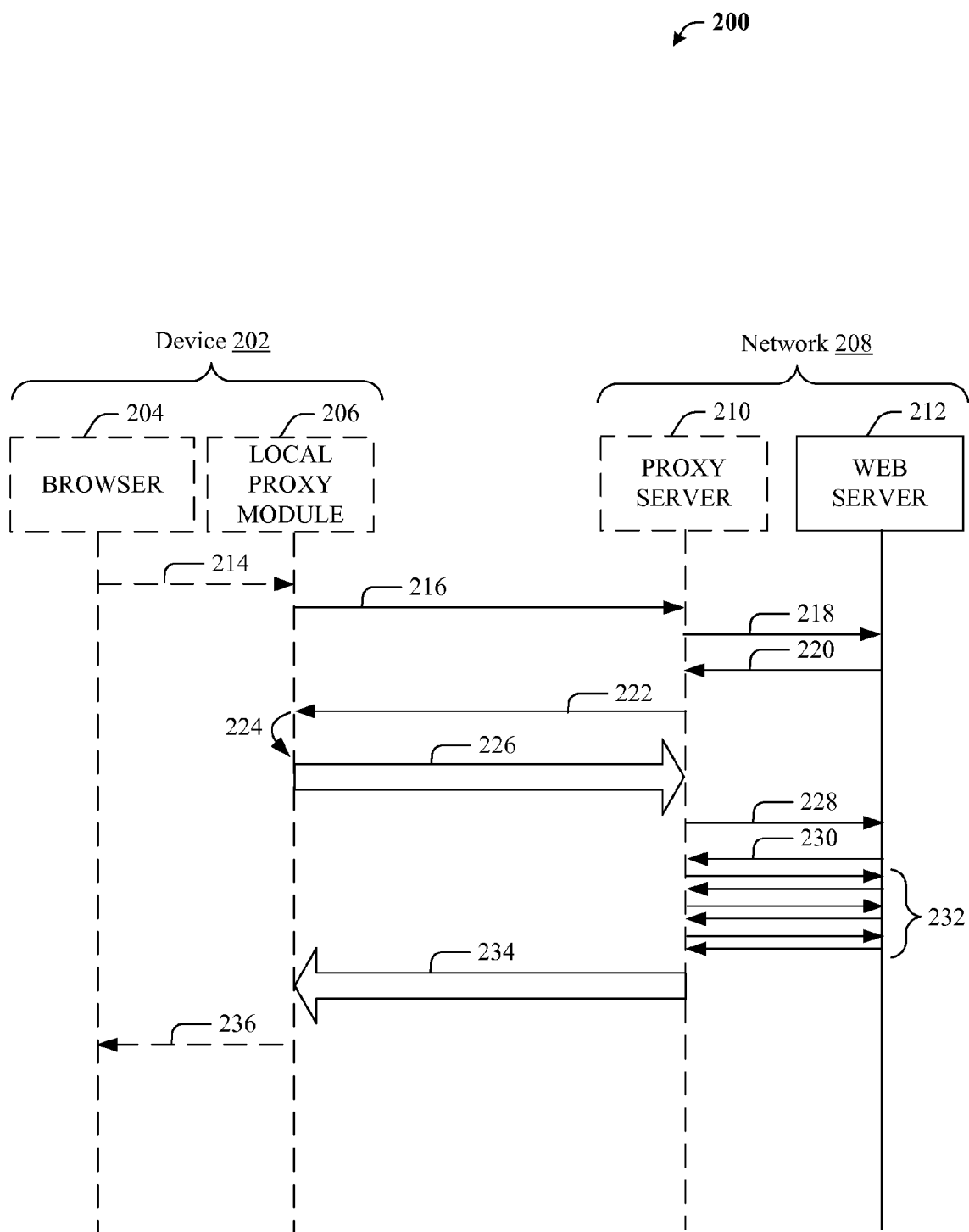


FIG. 2

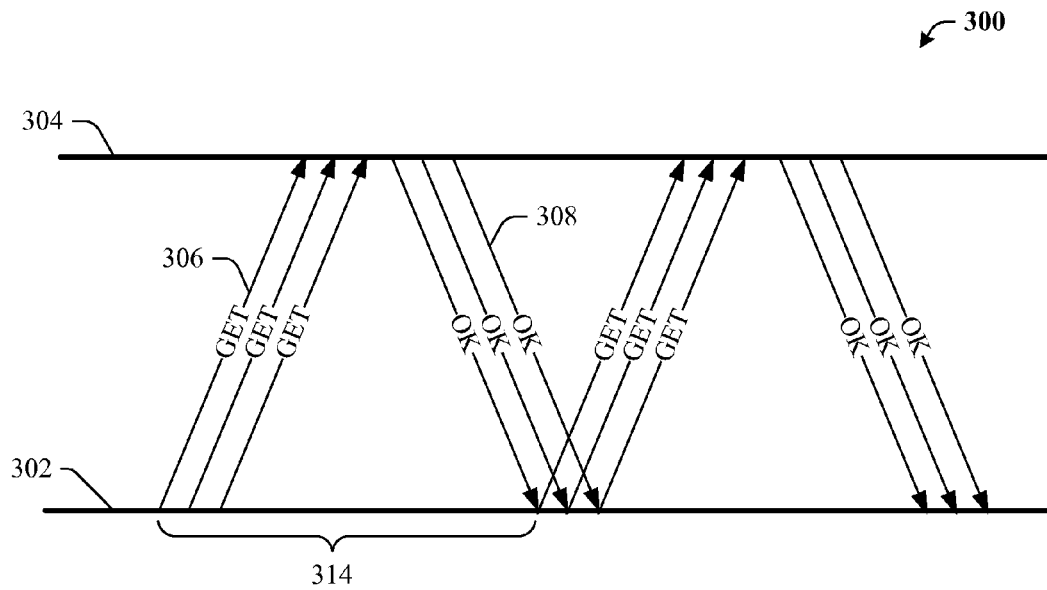


FIG. 3A

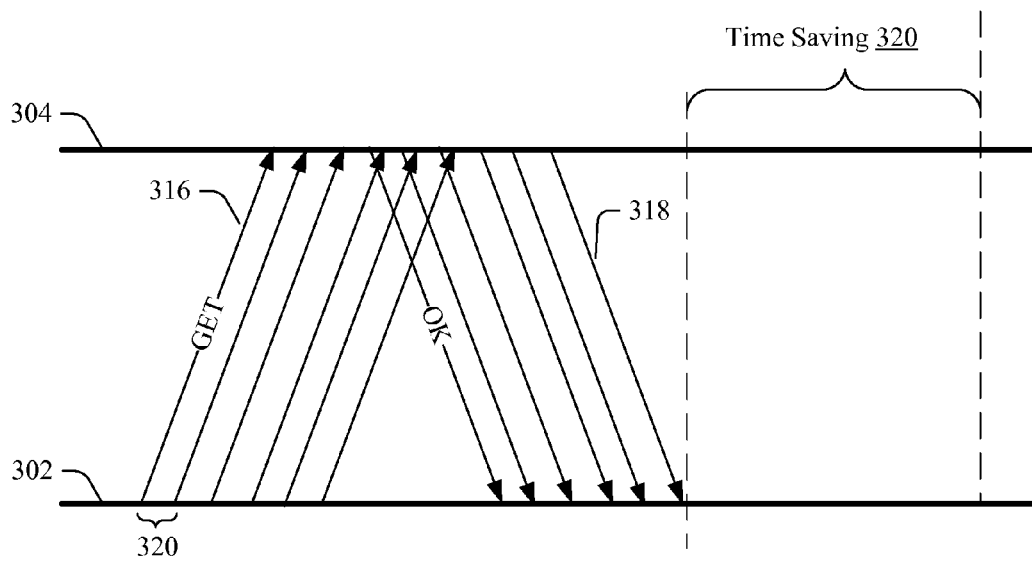


FIG. 3B

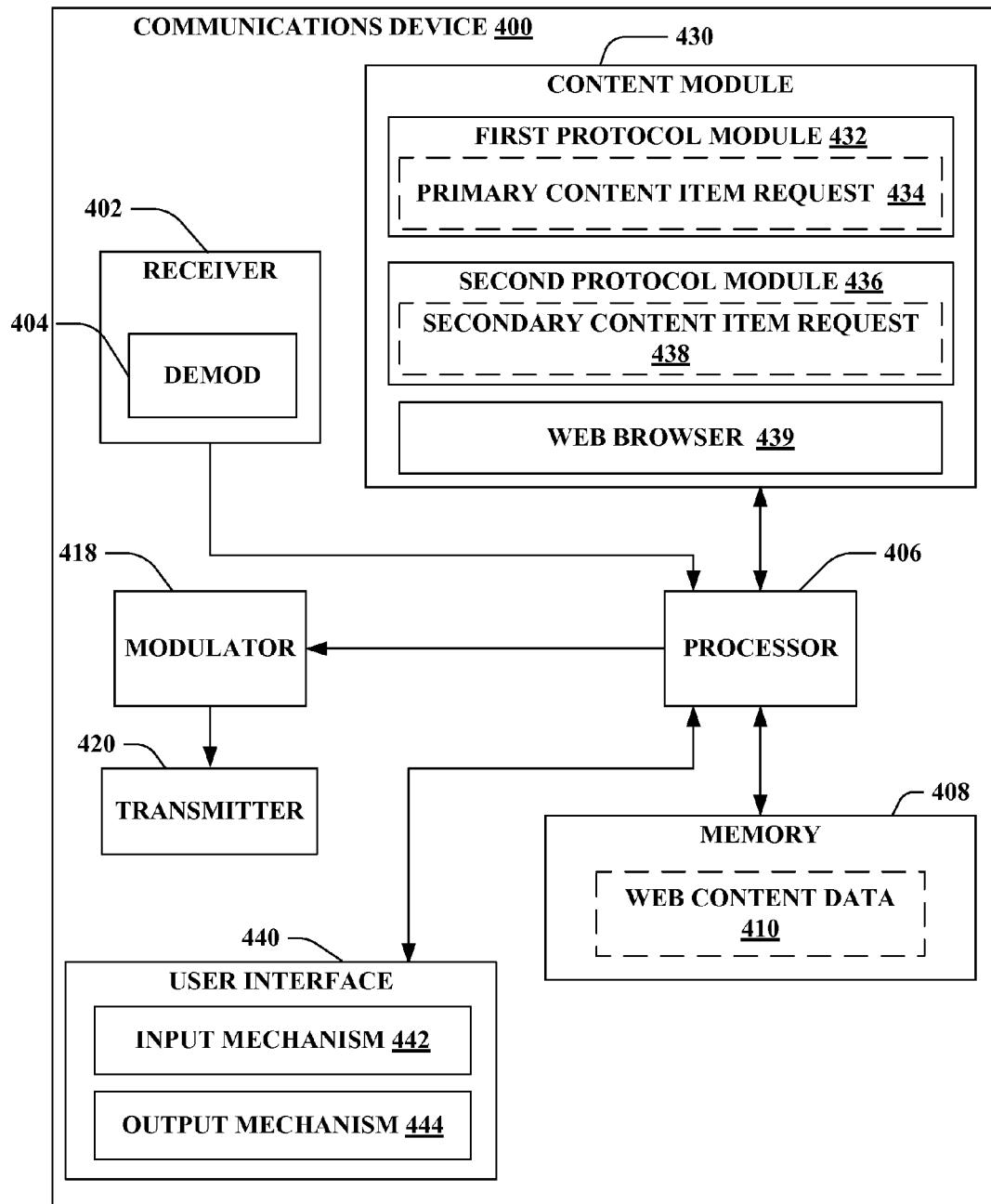


FIG. 4

130

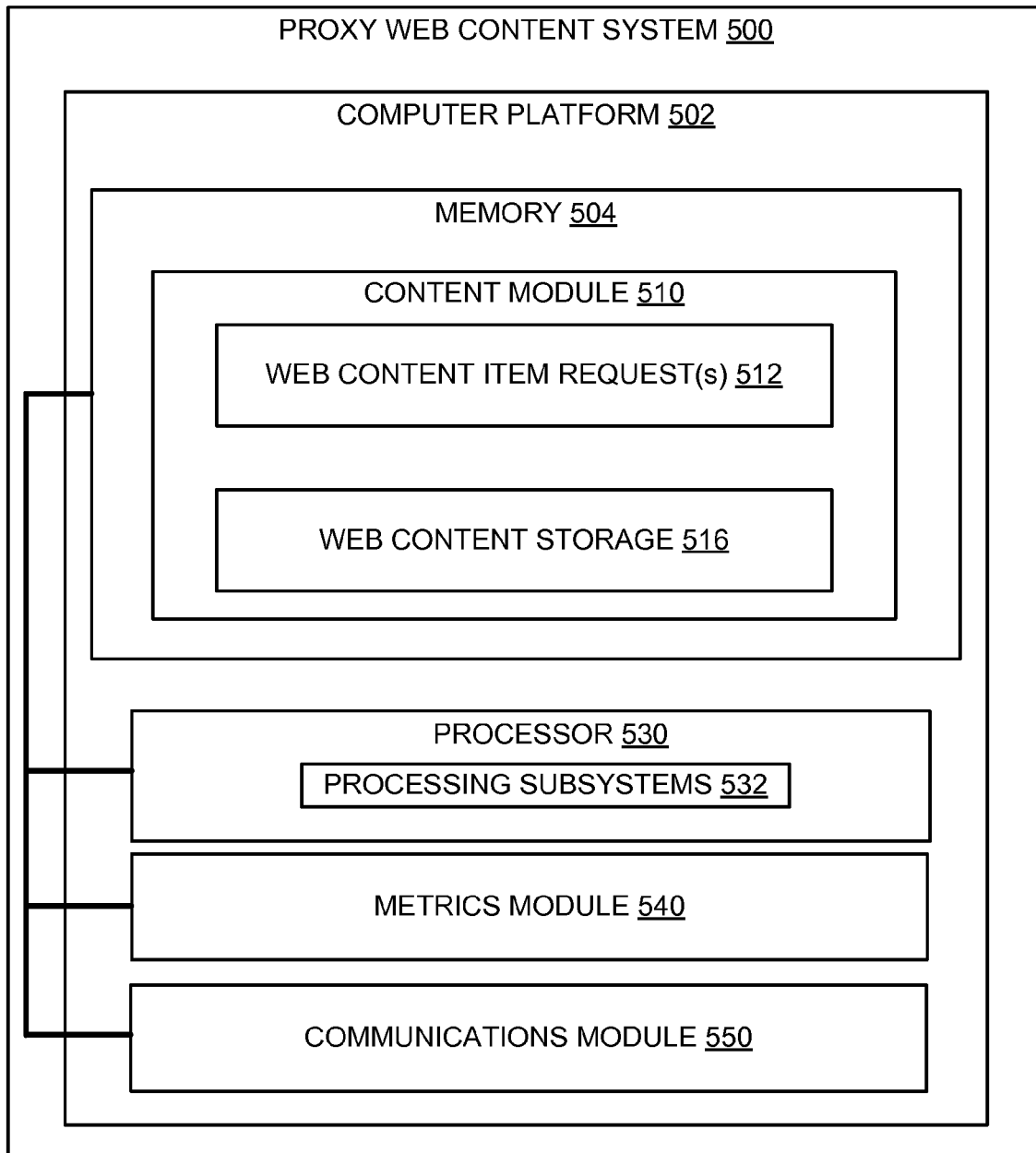


FIG. 5

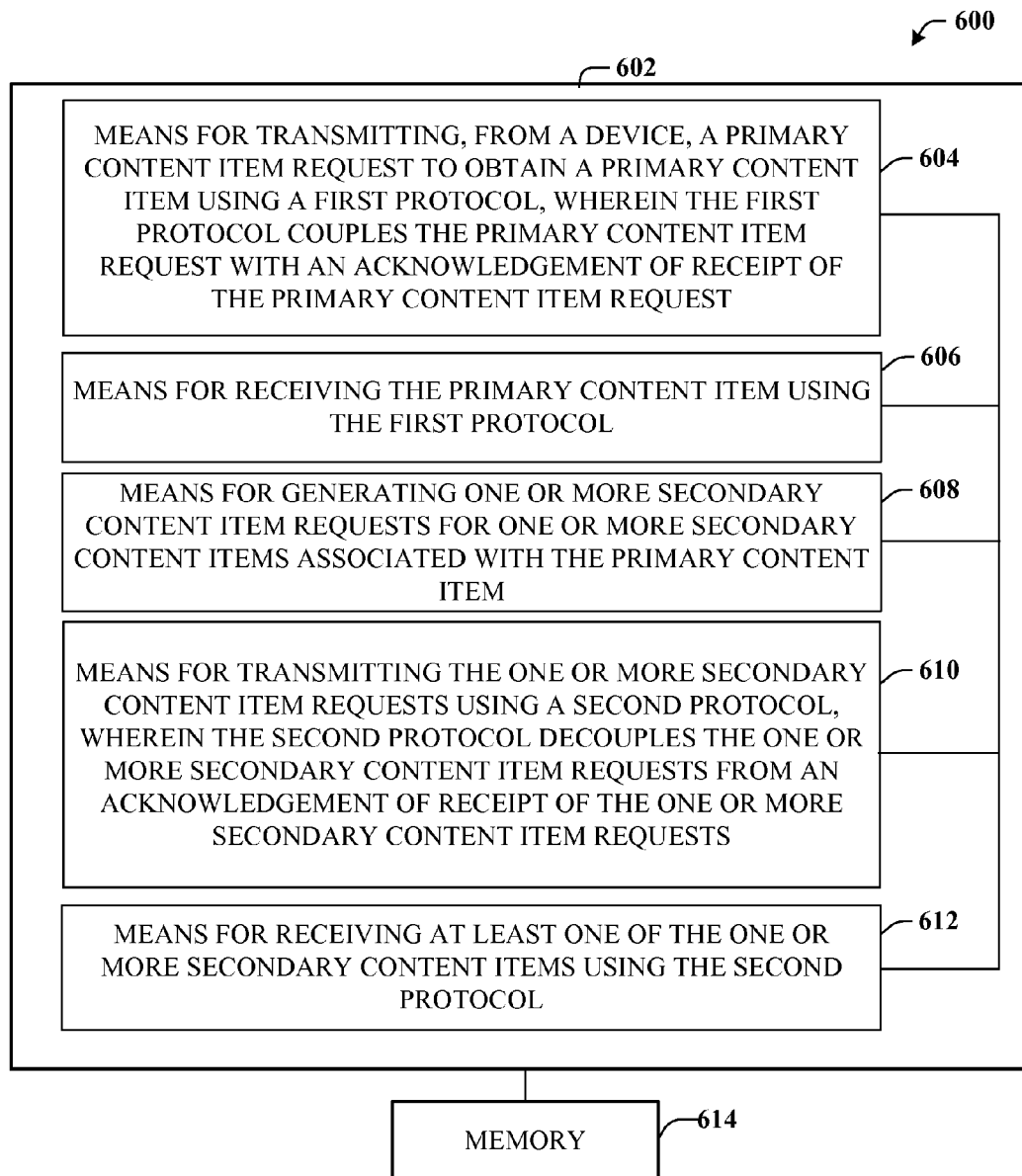


FIG. 6

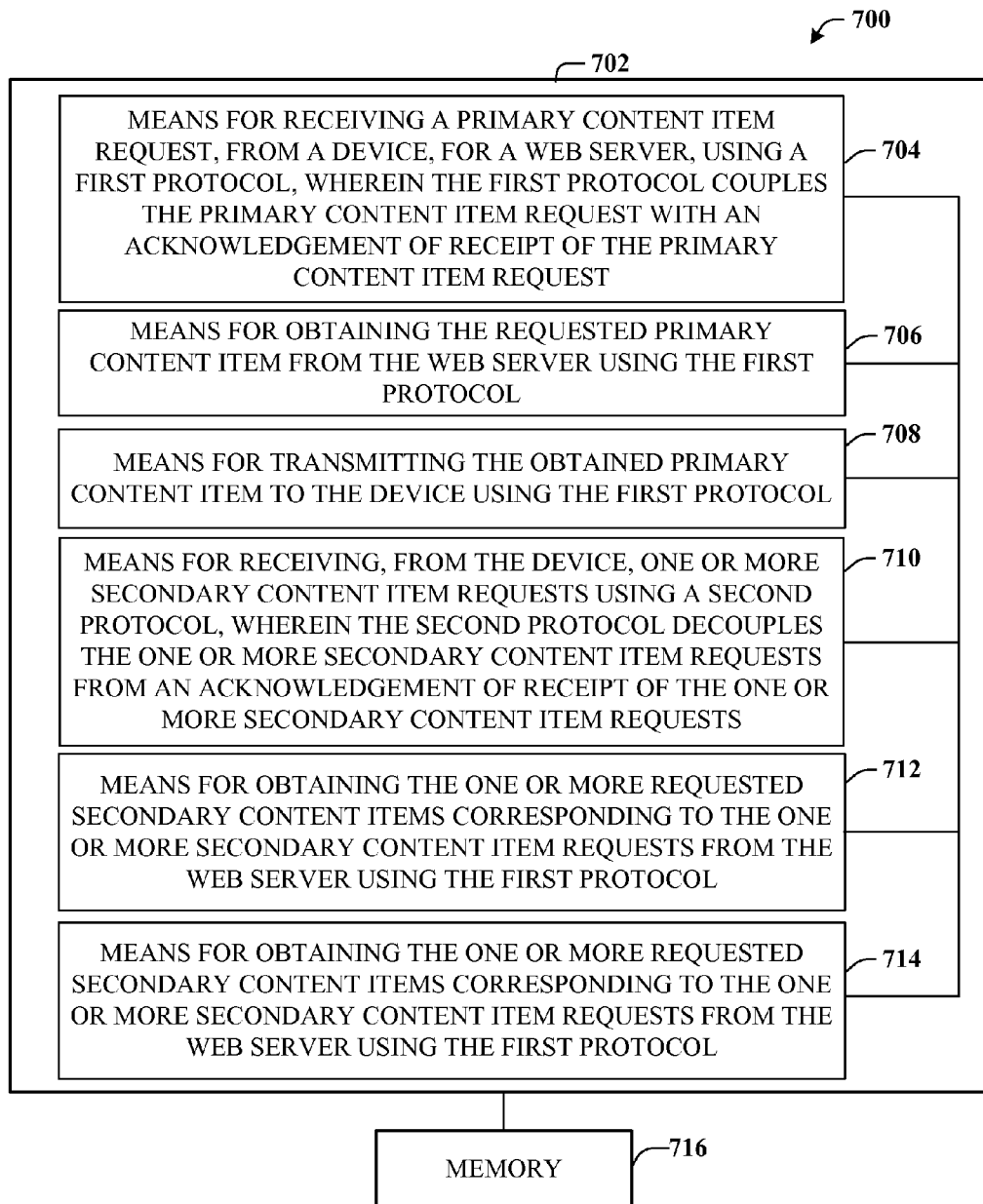


FIG. 7

1

METHODS AND APPARATUS FOR OBTAINING CONTENT WITH REDUCED ACCESS TIMES

CLAIM OF PRIORITY UNDER 35 U.S.C. §119

The present application for patent claims priority to Provisional Application No. 60/106,111 entitled "One-Shot Browsing to Reduce HTTP Page Download Delay" filed Oct. 16, 2008, and assigned to the assignee hereof and hereby expressly incorporated by reference herein.

BACKGROUND

1. Field

The disclosed aspects relate to communications between a device and a network to obtained web content.

2. Background

Advances in technology have resulted in smaller and more powerful personal computing devices. For example, there currently exist a variety of portable personal computing devices, including wireless computing devices, such as portable wireless telephones, personal digital assistants (PDAs) and paging devices that are each small, lightweight, and can be easily carried by users. More specifically, the portable wireless telephones, for example, further include cellular telephones that communicate voice and data packets over wireless networks. Further, many such cellular telephones are being manufactured with relatively large increases in computing capabilities, and as such, are becoming tantamount to small personal computers and hand-held PDAs.

Still further, users of such device are interested in using the devices to access more web based content. Currently, a device may obtain web content relying on sequential transmission and acknowledgement protocols. As applied to a wired communications network, such protocols have not been found to be overly limiting, as the round trip times have been found to be relatively small. However, unlike in wired communications network, communications through wireless network may be unfavorably delayed through sequential transmission and acknowledgement protocols thereby increasing the time it takes to access web content.

Thus, improved apparatus and methods for obtaining content with access times are desired.

SUMMARY

The following presents a simplified summary of one or more aspects in order to provide a basic understanding of such aspects. This summary is not an extensive overview of all contemplated aspects, and is intended to neither identify key or critical elements of all aspects nor delineate the scope of any or all aspects. Its sole purpose is to present some concepts of one or more aspects in a simplified form as a prelude to the more detailed description that is presented later.

In accordance with one or more aspects and corresponding disclosure thereof, various aspects are described in connection with obtaining content with reduced access times. According to one aspect, a method for obtaining content with reduced access times is provided. The method can comprise transmitting, from a device, a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request. Further, the method can comprise receiving the primary content item using the first protocol. Still further, the method can comprise generating one or more secondary con-

2

tent item requests for one or more secondary content items associated with the primary content item. Additionally, the method can comprise transmitting the one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests. Moreover, the method can comprise receiving at least one of the one or more secondary content items using the second protocol.

Still another aspect relates to a computer program product comprising a computer-readable medium. The computer-readable medium can include a first set of codes for causing a computer to transmit, from a device, a primary content item request to a proxy server to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request. Further, the computer-readable medium can include a second set of codes for causing the computer to generate one or more secondary content item requests for one or more secondary content items associated with the primary content item. Still further, the computer-readable medium can include a third set of codes for causing the computer to transmit the one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests.

Yet another aspect relates to an apparatus. The apparatus can include means for transmitting, from a device, a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request. Further, the apparatus can comprise means for receiving the primary content item using the first protocol. Still further, the apparatus can comprise means for generating one or more secondary content item requests for one or more secondary content items associated with the primary content item. Additionally, the apparatus can comprise means for transmitting the one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests. Moreover, the apparatus can comprise means for receiving at least one of the one or more secondary content items using the second protocol.

Another aspect relates to an apparatus. The apparatus can include a communication module operable for: transmitting a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request, and receiving the primary content item using the first protocol. Further, the apparatus can include a content module operable for generating one or more secondary content item requests for one or more secondary content items associated with the primary content item. Still further, the apparatus communication module be operable for: transmitting the one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests, and receiving at least one of the one or more secondary content items using the second protocol.

Additionally, in accordance with one or more aspects and corresponding disclosure thereof, various aspects are described in connection with obtaining content for a device with reduced access times. According to one aspect, a method

3

for obtaining content for a device with reduced access times is provided. The method can comprise receiving a primary content item request, from a device, for a web server, using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request. Further, the method can comprise obtaining the requested primary content item from the web server using the first protocol. Still further, the method can comprise transmitting the obtained primary content item to the device using the first protocol. Additionally, the method can comprise receiving, from the device, one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests. Additionally, the method can comprise obtaining the one or more requested secondary content items corresponding to the one or more secondary content item requests, from the web server using the first protocol. Moreover, the method can comprise transmitting the obtained one or more secondary content items using the second protocol to the device.

Still another aspect relates to a computer program product comprising a computer-readable medium. The computer-readable medium can include a first set of codes for causing a computer to obtain, a requested primary content item from the web server using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request. Further, the computer-readable medium can include a second set of codes for causing the computer to transmit the obtained primary content item to the device using the first protocol. Still further, the computer-readable medium can include a third set of codes for causing the computer to obtain one or more requested secondary content items corresponding to the one or more secondary content item requests from the web server using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests. Still further, the computer-readable medium can include a fourth set of codes for causing the computer to transmit the obtained one or more secondary content items using the second protocol to the device.

Yet another aspect relates to an apparatus. The apparatus can include means for receiving a primary content item request, from a device, for a web server, using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request. Further, the apparatus can comprise means for obtaining the requested primary content item from the web server using the first protocol. Still further, the apparatus can comprise means for transmitting the obtained primary content item to the device using the first protocol. Yet further, the apparatus can comprise means for receiving, from the device, one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests. Additionally, the apparatus can comprise means for obtaining the one or more requested secondary content items corresponding to the one or more secondary content item requests, from the web server using the first protocol. Moreover, the apparatus can comprise means for transmitting the obtained one or more secondary content items using the second protocol to the device.

Another aspect relates to an apparatus. The apparatus can include a communication module operable for: receiving a primary content item request, from a device, for a web server,

4

using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request, obtaining the requested primary content item from the web server using the first protocol, transmitting the obtained primary content item to the device using the first protocol, receiving, from the device, one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests, obtaining the one or more requested secondary content items corresponding to the one or more secondary content item requests, from the web server using the first protocol, and transmitting the obtained one or more secondary content items using the second protocol to the device.

To the accomplishment of the foregoing and related ends, the one or more aspects comprise the features hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail certain illustrative features of the one or more aspects. These features are indicative, however, of but a few of the various ways in which the principles of various aspects may be employed, and this description is intended to include all such aspects and their equivalents.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed aspects will hereinafter be described in conjunction with the appended drawings, provided to illustrate and not to limit the disclosed aspects, wherein like designations denote like elements, and in which:

FIG. 1 illustrates a block diagram of a communication network according to an aspect;

FIG. 2 illustrates a message sequence chart of operation of an aspect depicted in FIG. 1;

FIG. 3A illustrates a content request protocol used in an aspect message sequence chart depicted in FIG. 2;

FIG. 3B illustrates another content request protocol used in an aspect message sequence chart depicted in FIG. 2;

FIG. 4 illustrates a block diagram example architecture of a communications device;

FIG. 5 illustrates exemplary block diagram of a proxy web content system according to an aspect;

FIG. 6 illustrates a block diagram of an exemplary communications device that can obtain content with reduced access times; and

FIG. 7 illustrates a block diagram of an exemplary network device that can obtain content for a communications device with reduced access times.

DETAILED DESCRIPTION

Various aspects are now described with reference to the drawings. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of one or more aspects. It may be evident, however, that such aspect(s) may be practiced without these specific details.

Generally, a user may attempt to retrieve content accessible from a web server 140 from a device 110. In one aspect, a device 110 may include: a wireless communications device (WCD), multiple devices, both wireline and wireless. For example, multiple devices may work in tandem, as a network, etc. In such an instance, the device 110 may obtain the requested primary content item, e.g. a main web page, for access by the user. Additionally, device 110 may communi-

5

cate with a proxy server **130** to obtain secondary content items associated with the primary content item, e.g. a web page, object, etc., linked to the primary content item, prior to the user requesting such secondary content items. Retrieval of these secondary content items may be performed using a specific protocol. The specific protocol, hereinafter referred to as a second protocol, reduces the round trip time of a series of content item requests and corresponding acknowledgements by allowing the requests to be decoupled from any associated acknowledgement of a prior request. As such, using the second protocol, a plurality of requests may be sent over a single connection path unencumbered by any delays associated with waiting for an receipt acknowledgement response from a prior request.

With reference to FIG. 1, a block diagram of a communication network **100** according to an aspect is illustrated. Communication network **100** may include communications devices **110** connected to a communication network **125**, e.g., a CDMA network, a GPRS network, a UMTS network, and other types of communication networks. Communication network **100** may further include a plurality of servers, such as proxy server **130**, and web server **140**, connected to communication network **125**. In one aspect, the proxy server **130** facilitates communications between the communications device **110** and the web server **140**, via network **125**. Further, it should be noted that the functions performed by proxy server **130** may be performed internally by web server **140**, by multiple remote servers, and/or by communications device **110**.

In one aspect, communications device **110** may further include web content module **112** and device web content storage **118**. In another aspect, communications device **110** may additionally include an application **120** for requesting web content, such as but not limited to a web browser. In one aspect, web content module **112** may include primary content items requests and secondary content items requests **116**. For example, a primary content item request may be received from a user, through a web browser, requesting a main html web page, or the like. In another aspect, secondary content items may include any other items, accessible through the primary content item, such as, objects, content, etc., for which a client may use an HTTP GET to obtain. Continuing the example, such secondary content items may include additional web pages linked to the main web page, objects accessible for download or viewing from the main page, etc. Further, in one aspect, primary and/or secondary content items may be stored on the communications device **110** in device web content storage **118**. Additionally, device web content storage **118** may be searched prior to requesting additional primary and/or secondary content items from a web server.

In one aspect, proxy server **130** may further include web content module **132** and proxy web content storage **138**. In one aspect, web content module **132** may include primary content item requests **114** and secondary content item requests **116**. Further, in one aspect, web server **140** may include one or more primary content items **142** and one or more secondary content items **144** stored in proxy web content storage **138**.

In operation, communication device **110** may transmit a primary content item request **114** to a proxy server **130** via network **125**. In one aspect, the transmission may be made using a first protocol **127**. In such an aspect, the first protocol **127** may include Hyper Text Transfer Protocol (HTTP), etc., in which an acknowledgement of a GET message is required before a subsequent GET message can be transmitted. Further discussion of the first protocol **127** is provided with reference to FIG. 3A. Thereafter, proxy server **130** may receive the

6

primary content item request (**114**). Proxy server **130** may transmit the primary content item request **114** (e.g. an HTTP GET) to a web server **140** to obtain the requested primary content item **142** using the first protocol **127**. Upon receipt of the primary content item **142**, the proxy server **130** may transmit the primary content item **142** to the requesting communications device **110** using the first protocol **127**. Further, communications device **110** may process the received primary content item **142** to determine possible secondary content items **144** that may be requested by a user of the communications device **110**. Such secondary content items may be requested using one or more secondary content items requests **116** and transmitted using a second protocol **129** to the proxy server **130**. In such an aspect, the second protocol **129** may include a TCP connection and/or another like protocol in which subsequent GET messages are decoupled from receipt of an affirmative response (OK) to a prior GET message. In such an aspect, a transaction identifier may be added to the GET to distinguish which OK is associated with which GET. Further discussion of the second protocol **129** is provided with reference to FIG. 3B. Upon receipt of the one or more secondary content item requests **116** (e.g. HTTP GETs), proxy server **130** may retrieve one or more requested secondary content items **144** using the first protocol **127** from the web server **140** and may transmit such obtained secondary content items to communications device **110** using the second protocol **129**. In one aspect, proxy server **130** may include a proxy web content storage **138** which may store previously requested primary and secondary content items (**142**, **144**). In such an aspect, proxy server **130** may retrieve the requested primary and/or secondary content items from proxy web content storage **138** rather than requesting said content items from web server **140**.

As such, a device may receive secondary content items through use of a second protocol to reduce round trip times and thereby allow quicker access to the secondary content items.

With reference to FIG. 2, operation of the subject matter depicted in FIG. 1 in the form of a message sequence diagram is illustrated. Generally, device **202** may request content from network **208**. In one aspect, device **202** may include a web browser **204** to receive a web content request from a user and local proxy **206** to obtain the requested content. Further, network **208** may include a proxy server **210** to process content requests and one or more web servers **212** from which the requested content may be obtained.

In one aspect, web browser **204** may request a primary content item, at sequence step **214**. For example, a primary content item may include a main web page, or the like. In one aspect, a primary content item request may include an additional header which includes an IP address for a specific web server **212** to which the request is to be transmitted. For example, when requesting content from an encrypted site, the IP address for the specified web server may be transmitted free of encryption. Further, in such an aspect, the additional header may include a transaction identifier that may define which connection path is used for communicating the request. At sequence step **216**, local proxy module **206** transmits a primary content item request to proxy server **210**. In one aspect, the transmission is communicated using a first protocol. In such an aspect, the first protocol may include Hyper Text Transfer Protocol (HTTP), etc., in which an acknowledgement of a GET message is required before a subsequent GET message can be transmitted. In another aspect, communications between the local proxy module **206** and proxy server **210** may be facilitated using a second protocol. In such an aspect, the second protocol may include a File Transfer

Protocol (FTP) or another like protocol in which subsequent GET messages are decoupled from receipt of an affirmative response (OK) to a prior GET message.

At sequence step 218, proxy server 210 transmits the primary content item request to a web server 212. In one aspect, proxy server 210 may be embodied as a physically separate server as web server 212. While in another aspect, web server 212 and/or related servers may perform functions associated with proxy server 210. In another aspect, the transmission is made using the first protocol. In yet another aspect, the primary content item request includes instructions selecting the web server 212. In one aspect, the request may be accompanied by an additional header which may include information specifying an IP address for a specified web server and may include a transaction identifier identifying the connection path on which the request was received. In another aspect, if the primary content item request was transmitted using the second protocol, the proxy server 210 may translate the primary content item request before transmitting the request using the first protocol. In such an aspect, translating may include receiving an HTTP GET using an HTTP protocol from device 202 on one or more TCP sockets and forwarding the HTTP GET using a HTTP protocol. In another aspect, the translating may include receiving an HTTP GET using a modified HTTP protocol, and forwarding the received GET using a standard HTTP protocol. In such an aspect, the modified HTTP protocol may include a transactional identifier associating each request (e.g. GET) with a subsequent corresponding response. Further, in such an aspect, use of a modified HTTP GET protocol may allow responses to be transmitted as they are obtained rather than waiting to respond in the same order as the GETs were received.

At sequence step 220, the requested primary content item may be transmitted to the proxy server 210. In one aspect, the transmission is made using the first protocol. At sequence step 222, the primary content item is transmitted to the device 202. In one aspect, the transmission is made using the first protocol. In another aspect, if the primary content item request was transmitted using the second protocol, the proxy server 210 may translate the primary content item received using the first protocol from the web server 212, to the second protocol before transmitting the requested item to the device 202. In another aspect, the content item may be transmitted over a connection path determined by a transaction identifier which accompanied the corresponding content item request.

At sequence step 224, device 202 may process the received primary content item to locate secondary content items accessible through the primary content item. In one aspect, local proxy module may further search the device 202 to determine if any of the located secondary content items are already stored on device 202. For example, device 202 may store web content items in a cache. At sequence step 226, the one or more located secondary content items, or in another aspect the non-cached located secondary content items, are requested through secondary content item requests transmitted to proxy server 210. In one aspect, each request may be associated with an additional header that may include a transaction identifier and an IP address for a specified web server. In such an aspect, requests for encrypted web content may be transmitted using non-encrypted (e.g. clean) IP addresses for the associated web server. In one aspect, the requests are transmitted without limitations associated with receiving an acknowledgement, using the second protocol. In such an aspect, the second protocol may decouple transmitting a request from a requirement of receiving an acknowledgement of a prior request. For example, a first request may be transmitted through a serial TCP connection using the second

protocol, thereafter the second protocol allows a plurality of subsequent requests to be transmitted at the same time, or in a series, before an affirmative reception response for the first request is received.

At sequence step 228, proxy server 210 transmits the one or more received requests, using the first protocol, to web server 212 for the requested secondary content items. At sequence step 230 the requested secondary content items may be received from the web server 212 by the proxy server using the first protocol. In one aspect, as the first protocol may limit communications by requiring affirmative confirmation of the previous message receipt prior to transmitting a subsequent message, the proxy server 210 may transmit subsequent secondary content item requests in series after receiving an acknowledgement for a prior request. Such series transmissions are represented by the arrow set 232. At sequence step 234, the requested secondary content items are transmitted to device 202. In one aspect, the secondary content items are transmitted using the second protocol. In another aspect, the received secondary content items are stored on the device 202 for possible future access through a user selection. In another aspect, the secondary content items are transmitted over a connection path defined through an associated transaction identifier. In such an aspect, the remote proxy 210 may associate the transaction identifier from the additional header with a connection path (e.g. TCP socket) on which the request was received.

In one aspect, in a device which receives a request for one of the secondary content items from a web browser 204, at sequence step 236, the requested secondary content item may be provided to the web browser. In one aspect, the secondary content item may be retrieved from storage on the device 202. As such, a device may receive secondary content items through use of a second protocol to reduce web content accessing times.

Referring to FIGS. 3A and 3B, exemplary communication paths are depicted as parallel lines with a transmitting entity 302 and a receiving entity 304. Additionally, a communications from the transmitting entity 302 is depicted as a GET message (e.g. 306, 316), and a response from the receiving entity 304 is depicted as an OK message (e.g. 308, 318). The relationship between the GET messages and OK messages is described with reference to each of FIG. 3A and FIG. 3B.

With reference to FIG. 3A, exemplary communications using a first protocol are depicted, in which each GET message 306 is coupled to an acknowledgment of receipt (OK) message 308 such that a subsequent GET message may not be sent until the acknowledgement for the prior GET message is received. In one aspect, multiple sockets may be assigned for communications of GETs 306 and OKs 308. In such an aspect, the time between transmissions 314 over one or more sockets is limited by the round trip time of each coupled GET and OK message sequence. In one aspect, the first protocol may include a Hypertext Transfer Protocol (HTTP). For example, a primary content item request may be transmitted through a serial TCP connection using the HTTP, wherein the HTTP does not allow a subsequent content request to be transmitted through the serial TCP connection until an affirmative reception response for the transmitted primary content item request is received.

With reference to FIG. 3B, exemplary communications using a second protocol are depicted, in which each GET message 316 is not coupled to an acknowledgment of receipt (OK) message 318 such that any number of GET messages may be sent without being limited by the requirement of receiving the acknowledgement for prior associated GET messages. In one aspect, multiple GETs 316 may be trans-

mitted over one or more sockets. In such aspects, the time between transmissions **320** using one or more sockets are not limited by the round trip time of the GET and OK message sequence. Therefore, a time saving **322** may be obtained through use of the second protocol. In one aspect, the second protocol may decouple requests from corresponding acknowledgements of receipt of the requests. For example, a first request may be transmitted through a serial TCP connection using the second protocol, thereafter the second protocol allows a second request to be transmitted before acknowledgement for the first request is received.

While still referencing FIG. 1, but turning also now to FIG. 4, an example architecture of communications device **110** is illustrated. As depicted in FIG. 4, device **400** comprises receiver **402** that receives a signal from, for instance, a receive antenna (not shown), performs typical actions on (e.g., filters, amplifies, downconverts, etc.) the received signal, and digitizes the conditioned signal to obtain samples. Receiver **402** can comprise a demodulator **404** that can demodulate received symbols and provide them to processor **406** for channel estimation. Processor **406** can be a processor dedicated to analyzing information received by receiver **402** and/or generating information for transmission by transmitter **420**, a processor that controls one or more components of mobile device **400**, and/or a processor that both analyzes information received by receiver **402**, generates information for transmission by transmitter **420**, and controls one or more components of mobile device **400**.

Mobile device **400** can additionally comprise memory **408** that is operatively coupled to processor **406** and that can store data to be transmitted, received data, information related to available channels, data associated with analyzed signal and/or interference strength, information related to an assigned channel, power, rate, or the like, and any other suitable information for estimating a channel and communicating via the channel. In one aspect, memory **408** can include web content data **410**, such as but not limited to, at least a portion of objects, content, etc., obtained by device **400** during interaction with one or more web content providers. In one aspect, stored web content cached data **410** may be searched to determine if any currently requested secondary content items are already stored on the device **400**. In another aspect, web content data **410** may include an indexing structure to further facilitate searching for currently requested secondary content. Memory **408** can additionally store protocols and/or algorithms associated with estimating and/or utilizing a channel (e.g., performance based, capacity based, etc.).

It will be appreciated that data store (e.g., memory **408**) described herein can be either volatile memory or nonvolatile memory, or can include both volatile and nonvolatile memory. By way of illustration, and not limitation, nonvolatile memory can include read only memory (ROM), programmable ROM (PROM), electrically programmable ROM (EPROM), electrically erasable PROM (EEPROM), or flash memory. Volatile memory can include random access memory (RAM), which acts as external cache memory. By way of illustration and not limitation, RAM is available in many forms such as synchronous RAM (SRAM), dynamic RAM (DRAM), synchronous DRAM (SDRAM), double data rate SDRAM (DDR SDRAM), enhanced SDRAM (ESDRAM), Synchlink DRAM (SLDRAM), and direct Rambus RAM (DRRAM). Memory **408** of the subject systems and methods may comprise, without being limited to, these and any other suitable types of memory.

Mobile device **400** can further include content module **430** to facilitate and/or obtain web content for device **400**. Content module **430** may further comprise first protocol module **432**

to assist content module **430** in communicating a primary content item request **434** to a content provider, such as a web server, etc. In one aspect, a primary content item request **434** may include a request for content associated with a main web page. In another aspect, a primary content item request **434** may include instructions for a proxy server to obtain the primary content item from a web server. In one aspect, the first protocol may include a Hypertext Transfer Protocol (HTTP). For example, a primary content item request may be transmitted through a serial TCP connection using the HTTP and wherein the HTTP does not allow a subsequent content request to be transmitted through the serial TCP connection until an affirmative reception response for the transmitted primary content item request is received.

In one aspect, content module **430** may further process a received primary content item. In such an aspect, content module **430** may locate possible access points for secondary content item accessible through the primary content item. Further, in such an aspect, prior to generating secondary content item requests for the located secondary content items, content module **430** may search web content data **410** to determine if any located secondary content items may be stored in the device **400**. Furthermore, such stored secondary content items may be made available to content module **430** and a request is not made for the stored secondary items.

Content module **430** may further comprise second protocol module **436** to assist content module **430** in communicating a one or more secondary content item request **438** to a proxy server, or the like. In one aspect, second protocol module **436** may process secondary content item requests **438** using a second protocol. In such an aspect, the second protocol may decouple any secondary content item requests from an acknowledgement of receipt of secondary content item requests from a proxy server. For example, a first of the one or more secondary content item requests may be transmitted through a serial TCP connection using the second protocol, thereafter the second protocol allows a second of the one or more secondary content item requests to be transmitted before an affirmative reception response for the first of the one or more secondary content item requests request is received.

In another aspect, content module **430** may further include web browser **439**. In such an aspect, web browser **439** may receive user inputs through user interface **440** requesting certain web content. For example, a user may enable web browser **439** and provide input selecting a specific web page of interest. In such an example, web browser **439** may communicate the requested web page, as a primary content item request **434**, to first protocol module **432** for processing.

Additionally, mobile device **400** may include user interface **440**. User interface **440** may include input mechanisms **442** for generating inputs into communications device **400**, and output mechanism **442** for generating information for consumption by the user of the communications device **400**. For example, input mechanism **442** may include a mechanism such as a key or keyboard, a mouse, a touch-screen display, a microphone, etc. Further, for example, output mechanism **444** may include a display, an audio speaker, a haptic feedback mechanism, a Personal Area Network (PAN) transceiver etc. In the illustrated aspects, the output mechanism **444** may include a display operable to present media content that is in image or video format or an audio speaker to present media content that is in an audio format.

In operation, a user may prompt the communications device **400** to initiate a first application through a second application. For example, first application may be an FM-RDS application; the second application may be a music download service application. Extension module **430** may

11

facilitate communication of application data **410** and control information **412** between at least two applications through the use of application communication module **432** and application control module **434**. For example, communicated application data **410** may include at least a portion of RDS data or digital music data, control information **412** may include control of a music download service application purchasing function, volume, display, etc. Furthermore, data and control module **436** may obtain and/or store at least a portion of application data **410** and control information **412** communicated between applications. For example, communications stored may include at least a portion of: the RDS data, or the digital music data, or a purchasing record, or any combination thereof.

With reference to FIG. 5, illustrated is a detailed block diagram of proxy web content system **500**, such as proxy server **130** depicted in FIG. 1. Proxy web content system **500** may comprise at least one of any type of hardware, server, personal computer, mini computer, mainframe computer, or any computing device either special purpose or general computing device. Further, the modules and applications described herein as being operated on or executed by proxy web content system **500** may be executed entirely on a single network device, as shown in FIG. 5, or alternatively, in other aspects, separate servers, databases or computer devices may work in concert to provide data in usable formats to parties, and/or to provide a separate layer of control in the data flow between communications device **110**, web server **140**, etc., and the modules and applications executed by proxy web content system **500**.

Proxy web content system **500** includes computer platform **502** that can transmit and receive data across wired and wireless networks, and that can execute routines and applications. Computer platform **502** includes memory **504**, which may comprise volatile and nonvolatile memory such as read-only and/or random-access memory (ROM and RAM), EPROM, EEPROM, flash cards, or any memory common to computer platforms. Further, memory **504** may include one or more flash memory cells, or may be any secondary or tertiary storage device, such as magnetic media, optical media, tape, or soft or hard disk. Further, computer platform **502** also includes processor **530**, which may be an application-specific integrated circuit ("ASIC"), or other chipset, logic circuit, or other data processing device. Processor **530** may include various processing subsystems **532** embodied in hardware, firmware, software, and combinations thereof, that enable the functionality of media content distribution system **14** and the operability of the network device on a wired or wireless network.

Computer platform **502** further includes communications module **550** embodied in hardware, firmware, software, and combinations thereof, that enables communications among the various components of extension system **500**, as well as between extension system **500**, devices **110**, and servers **130**, **140**. Communication module **550** may include the requisite hardware, firmware, software and/or combinations thereof for establishing a wireless communication connection. According to described aspects, communication module **550** may include the necessary hardware, firmware and/or software to facilitate wireless communication between web server **140** and device **110**.

Computer platform **502** further includes metrics module **540** embodied in hardware, firmware, software, and combinations thereof, that enables metrics received from device **110** corresponding to, among other things, data communicated between device **110** and web server **140**. In one aspect, proxy web content system **500** may analyze data received through

12

metrics module **540** to modify any web content **516** stored in memory **504**. For example, if the metrics module **540** returns data indicating users select specific secondary content items more often than others, then such preferred secondary content may be stored in web content storage **516**. As such, secondary content item requests may be reduced to a web server **140** and return time for content requested by a device **110** may be further reduced.

Memory **504** of proxy web content system **500** includes a content module **510** operable to facilitate obtaining primary and secondary content items from web servers, such as web server **140** depicted in FIG. 1, for wireless devices, such as device **110** depicted in FIG. 1. Content module **510** may include one or more web content item requests **512** and web content storage **516**. In one aspect, the one or more web content item requests **512** (e.g. GETs) may include a primary content item request received from a wireless device, such as device **110**, using a first protocol and relayed to a web server to retrieve the requested primary content item. In one aspect, the first protocol may include a Hypertext Transfer Protocol (HTTP). For example, the primary content item request may be transmitted through a serial TCP connection using the HTTP wherein the HTTP does not allow a subsequent content request to be transmitted through the serial TCP connection until an affirmative reception response for the transmitted primary content item request is received. In one aspect, secondary content item requests **514** may be generated by content module **510** for transmission to a web server associated with the primary content item using the first protocol. Further, in another aspect, the one or more web content item requests **512** (e.g. GETs) may include secondary content item requests received from a device **110** using a second protocol. In such an aspect, the secondary content items retrieved from the web server may be matched to the secondary content item requests received from the wireless device, and the matched secondary content items may be transmitted to the device using the second protocol. In one aspect, the second protocol may allow a second of the one or more secondary content item requests to be transmitted before an affirmative reception response for a first of the one or more secondary content item requests request is received.

With reference to FIG. 6, a block diagram of an exemplary system **600** that can obtain content with reduces round trip times is illustrated. For example, system **600** can reside at least partially within a wireless device. According to another example aspect, system **600** can reside at least partially within an access terminal. It is to be appreciated that system **600** is represented as including functional blocks, which can be functional blocks that represent functions implemented by a processor, software, or combination thereof (e.g., firmware). System **600** includes a logical grouping **602** of means that can act in conjunction. For instance, logical grouping **602** can include means for transmitting, from a device, a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request **604**. In one aspect, the primary content item request may be received from a web browser, or the like, associated with the device. In another aspect, the primary content item may include a main web page, and wherein the one or more secondary content items include objects accessible through the main web page. In still another aspect, the primary content item request may include instructions for a proxy server to obtain the primary content item from a web server.

Further, logical grouping **602** can comprise means for means for receiving the primary content item using the first

13

protocol **606**. In one aspect, the first protocol may include a Hypertext Transfer Protocol (HTTP), wherein the primary content item request is transmitted through a TCP connection using the HTTP; and wherein the HTTP does not allow a subsequent content request to be transmitted through the TCP connection until the acknowledgement for the transmitted primary content item request is received. Further, logical grouping **602** can comprise means for generating one or more secondary content item requests for one or more secondary content items associated with the primary content item **608**. In one aspect, the generating may include determining if any of the one or more secondary content items is stored on the device, and generating the secondary content item request for each of the secondary content items not stored on the device.

Further, logical grouping **602** can comprise transmitting the one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests **610**. In one aspect, the transmitting the one or more secondary content item requests further may include transmitting through one or more connection paths, wherein the one or more connection paths allows the one or more secondary content item requests to be transmitted in series. In such an aspect, the connection path may be a TCP connection, and wherein the second protocol allows a plurality of the one or more secondary content item requests to be transmitted before the acknowledgement for any of the one or more secondary content item requests is received. Further, logical grouping **602** can comprise receiving at least one of the one or more secondary content items using the second protocol **612**. In another aspect, the receiving the at least one of the one or more secondary content items may further include storing the received at least one of the one or more secondary content items in a cache associated with the device. Additionally, system **600** can include a memory **614** that retains instructions for executing functions associated with the means **604**, **606**, **608**, **610** and **612**. While shown as being external to memory **614**, it is to be understood that one or more of the means **604**, **606**, **608**, **610** and **612** can exist within memory **614**.

With reference to FIG. 7, a block diagram of an exemplary system **700** that can obtain content for a wireless communications device with reduces round trip times is illustrated. For example, system **700** can reside at least partially within a wireless device. According to another example aspect, system **700** can reside at least partially within an access terminal. It is to be appreciated that system **700** is represented as including functional blocks, which can be functional blocks that represent functions implemented by a processor, software, or combination thereof (e.g., firmware). System **700** includes a logical grouping **702** of means that can act in conjunction. For instance, logical grouping **702** can include means for receiving a primary content item request, from a device, for a web server, using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request **704**. In one aspect, the first protocol may include a Hypertext Transfer Protocol (HTTP), the primary content item request may be transmitted through a TCP connection using the HTTP and the HTTP may not allow a subsequent content request to be transmitted through the TCP connection until the acknowledgement for the transmitted primary content item request is received. Further, logical grouping **702** can comprise means for obtaining the requested primary content item from the web server using the first protocol **706**. In one aspect, the obtaining from the web server may further include

14

storing the obtained one or more secondary content items in storage associated with the proxy server. Further, logical grouping **702** can comprise means for transmitting the obtained primary content item to the device using the first protocol **708**. Further, logical grouping **702** can comprise receiving, from the device, one or more secondary content item requests using a second protocol, wherein the second protocol decouples the one or more secondary content item requests from an acknowledgement of receipt of the one or more secondary content item requests **710**. Additionally, logical grouping **702** can comprise means for obtaining the one or more requested secondary content items corresponding to the one or more secondary content item requests from the web server using the first protocol **712**.

Further, logical grouping **702** can comprise means for transmitting the obtained one or more secondary content items using the second protocol to the device **714**. In one aspect, the second protocol may allow a secondary content item to be transmitted decoupled from acknowledging receipt of an associated secondary content item request. In another aspect, the transmitting the one or more secondary content items further may include transmitting through one or more connection paths, wherein the one or more connection paths may allow the one or more secondary content items to be transmitted in series. In such an aspect, the connection path may be a TCP connection and a first of the one or more secondary content items may be transmitted through the TCP connection using the second protocol, wherein the second protocol allows a plurality of the one or more secondary content items to be transmitted before the acknowledgement for the first of the one or more secondary content items is received. Additionally, system **700** can include a memory **716** that retains instructions for executing functions associated with the means **704**, **706**, **708**, **710**, **712** and **714**. While shown as being external to memory **716**, it is to be understood that one or more of the means **704**, **706**, **708**, **710**, **712** and **714** can exist within memory **716**.

As used in this application, the terms “component,” “module,” “system” and the like are intended to include a computer-related entity, such as but not limited to hardware, firmware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a computing device and the computing device can be a component. One or more components can reside within a process and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers. In addition, these components can execute from various computer readable media having various data structures stored thereon. The components may communicate by way of local and/or remote processes such as in accordance with a signal having one or more data packets, such as data from one component interacting with another component in a local system, distributed system, and/or across a network such as the Internet with other systems by way of the signal.

Furthermore, various aspects are described herein in connection with a terminal, which can be a wired terminal or a wireless terminal. A terminal can also be called a system, device, subscriber unit, subscriber station, mobile station, mobile, mobile device, remote station, remote terminal, access terminal, user terminal, terminal, communication device, user agent, user device, or user equipment (UE). A wireless terminal may be a cellular telephone, a satellite phone, a cordless telephone, a Session Initiation Protocol

15

(SIP) phone, a wireless local loop (WLL) station, a personal digital assistant (PDA), a handheld device having wireless connection capability, a computing device, or other processing devices connected to a wireless modem. Moreover, various aspects are described herein in connection with a base station. A base station may be utilized for communicating with wireless terminal(s) and may also be referred to as an access point, a Node B, or some other terminology.

Moreover, the term “or” is intended to mean an inclusive “or” rather than an exclusive “or.” That is, unless specified otherwise, or clear from the context, the phrase “X employs A or B” is intended to mean any of the natural inclusive permutations. That is, the phrase “X employs A or B” is satisfied by any of the following instances: X employs A; X employs B; or X employs both A and B. In addition, the articles “a” and “an” as used in this application and the appended claims should generally be construed to mean “one or more” unless specified otherwise or clear from the context to be directed to a singular form.

The techniques described herein may be used for various wireless communication systems such as CDMA, TDMA, FDMA, OFDMA, SC-FDMA and other systems. The terms “system” and “network” are often used interchangeably. A CDMA system may implement a radio technology such as Universal Terrestrial Radio Access (UTRA), cdma2000, etc. UTRA includes Wideband-CDMA (W-CDMA) and other variants of CDMA. Further, cdma2000 covers IS-2000, IS-95 and IS-856 standards. A TDMA system may implement a radio technology such as Global System for Mobile Communications (GSM). An OFDMA system may implement a radio technology such as Evolved UTRA (E-UTRA), Ultra Mobile Broadband (UMB), IEEE 802.11 (Wi-Fi), IEEE 802.16 (WiMAX), IEEE 802.20, Flash-OFDM, etc. UTRA and E-UTRA are part of Universal Mobile Telecommunication System (UMTS). 3GPP Long Term Evolution (LTE) is a release of UMTS that uses E-UTRA, which employs OFDMA on the downlink and SC-FDMA on the uplink. UTRA, E-UTRA, UMTS, LTE and GSM are described in documents from an organization named “3rd Generation Partnership Project” (3GPP). Additionally, cdma2000 and UMB are described in documents from an organization named “3rd Generation Partnership Project 2” (3GPP2). Further, such wireless communication systems may additionally include peer-to-peer (e.g., mobile-to-mobile) ad hoc network systems often using unpaired unlicensed spectrums, 602.xx wireless LAN, BLUETOOTH and any other short- or long-range, wireless communication techniques.

Various aspects or features will be presented in terms of systems that may include a number of devices, components, modules, and the like. It is to be understood and appreciated that the various systems may include additional devices, components, modules, etc. and/or may not include all of the devices, components, modules etc. discussed in connection with the figures. A combination of these approaches may also be used.

The various illustrative logics, logical blocks, modules, and circuits described in connection with the aspects disclosed herein may be implemented or performed with a general purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof designed to perform the functions described herein. A general-purpose processor may be a microprocessor, but, in the alternative, the processor may be any conventional processor, controller, microcontroller, or state machine. A processor may also be implemented as

16

a combination of computing devices, e.g., a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration. Additionally, at least one processor may comprise one or more modules operable to perform one or more of the steps and/or actions described above.

Further, the steps and/or actions of a method or algorithm described in connection with the aspects disclosed herein may be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module may reside in RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, a hard disk, a removable disk, a CD-ROM, or any other form of storage medium known in the art. An exemplary storage medium may be coupled to the processor, such that the processor can read information from, and write information to, the storage medium. In the alternative, the storage medium may be integral to the processor. Further, in some aspects, the processor and the storage medium may reside in an ASIC. Additionally, the ASIC may reside in a user terminal. In the alternative, the processor and the storage medium may reside as discrete components in a user terminal. Additionally, in some aspects, the steps and/or actions of a method or algorithm may reside as one or any combination or set of codes and/or instructions on a machine readable medium and/or computer readable medium, which may be incorporated into a computer program product.

In one or more aspects, the functions described may be implemented in hardware, software, firmware, or any combination thereof. If implemented in software, the functions may be stored or transmitted as one or more instructions or code on a computer-readable medium. Computer-readable media includes both computer storage media and communication media including any medium that facilitates transfer of a computer program from one place to another. A storage medium may be any available media that can be accessed by a computer. By way of example, and not limitation, such computer-readable media can comprise RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium that can be used to carry or store desired program code in the form of instructions or data structures and that can be accessed by a computer. Also, any connection may be termed a computer-readable medium. For example, if software is transmitted from a website, server, or other remote source using a coaxial cable, fiber optic cable, twisted pair, digital subscriber line (DSL), or wireless technologies such as infrared, radio, and microwave, then the coaxial cable, fiber optic cable, twisted pair, DSL, or wireless technologies such as infrared, radio, and microwave are included in the definition of medium. Disk and disc, as used herein, includes compact disc (CD), laser disc, optical disc, digital versatile disc (DVD), floppy disk and blu-ray disc where disks usually reproduce data magnetically, while discs usually reproduce data optically with lasers. Combinations of the above should also be included within the scope of computer-readable media.

While the foregoing disclosure discusses illustrative aspects and/or aspects, it should be noted that various changes and modifications could be made herein without departing from the scope of the described aspects and/or aspects as defined by the appended claims. Furthermore, although elements of the described aspects and/or aspects may be described or claimed in the singular, the plural is contemplated unless limitation to the singular is explicitly stated. Additionally, all or a portion of any aspect and/or aspect may

17

be utilized with all or a portion of any other aspect and/or aspect, unless stated otherwise.

What is claimed is:

1. A method of obtaining content with reduced access times, the method comprising:
 - transmitting, from a device, a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;
 - receiving the primary content item using the first protocol;
 - generating two or more secondary content item requests for two or more secondary content items associated with the primary content item;
 - transmitting the two or more secondary content item requests using a second protocol and through a connection path, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, and wherein the two or more secondary content item requests are transmitted in series through the connection path such that a second one of the two or more secondary content item requests is transmitted after a first one of the two or more secondary content item requests and before a second acknowledgement is received for the first one of the two or more secondary content item requests over the connection path;
 - receiving the second acknowledgement for at least the first one of the two or more secondary content item requests over the connection path after transmitting the second one of the two or more secondary content item requests; and
 - receiving at least one of the two or more secondary content items using the second protocol,
 wherein the transmitting the primary content item request further comprises transmitting the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and
 - wherein the transmitting the two or more secondary content item requests further comprises transmitting the two or more secondary content item requests with another packet header.
2. The method of claim 1, wherein the connection path is a TCP connection, and wherein the second protocol allows a plurality of the two or more secondary content item requests to be transmitted before one of the corresponding acknowledgements for any of the two or more secondary content item requests is received.
3. The method of claim 1, wherein the second protocol uses a transaction identifier to associate each secondary content item request with a corresponding acknowledgement of receipt of the secondary content item request.
4. The method of claim 1, further comprising:
 - receiving the primary content item request from a web browser associated with the device using the first protocol;
 - receiving a request for at least one secondary content items from the web browser;
 - obtaining the requested at least one secondary content item from the received at least one of the two or more secondary content items; and

18

transmitting the obtained at least one secondary content item to the web browser using the first protocol.

5. The method of claim 1, wherein the generating further comprises:

determining if any of the two or more secondary content items is stored on the device; and

wherein the generating of the one more secondary content item requests is for each of the two or more secondary content items determined to be not stored on the device.

6. The method of claim 1, wherein the first protocol includes a Hypertext Transfer Protocol (HTTP), wherein the primary content item request is transmitted through a TCP connection using the HTTP; and wherein the HTTP does not allow a subsequent content request to be transmitted through the TCP connection until the acknowledgement for the transmitted primary content item request is received.

7. The method of claim 1, wherein the primary content item includes a main web page, and wherein the two or more secondary content items include objects accessible through the main web page.

8. The method of claim 1, wherein the primary content item request further includes instructions for a proxy server to obtain the primary content item from a specified web server.

9. A non-transitory computer-readable medium comprising computer-executable code for obtaining content with reduced access times, the code comprising:

code for transmitting, from a device, a primary content item request to a proxy server to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;

code for receiving the primary content item using the first protocol;

code for generating two or more secondary content item requests for two or more secondary content items associated with the primary content item; and

code for transmitting the two or more secondary content item requests using a second protocol and through a connection path, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, and wherein the two or more secondary content item requests are transmitted in series through the connection path such that a second one of the two or more secondary content item requests is transmitted after a first one of the two or more secondary content item requests and before a second acknowledgement is received for the first one of the two or more secondary content item requests over the connection path;

code for receiving the second acknowledgement for at least the first one of the two or more secondary content item requests over the connection path after transmitting the second one of the two or more secondary content item requests; and

code for receiving at least one of the two or more secondary content items using the second protocol,

wherein the code for transmitting the primary content item request transmits the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and

19

wherein the code for transmitting the two or more secondary content item requests transmits the two or more secondary content item requests with another packet header.

10. An apparatus, comprising:

means for transmitting, from a device, a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;

means for receiving the primary content item using the first protocol;

means for generating two or more secondary content item requests for two or more secondary content items associated with the primary content item;

means for transmitting the two or more secondary content item requests using a second protocol and through a connection path, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, and wherein the two or more secondary content item requests are transmitted in series through the connection path such that a second one of the two or more secondary content item requests is transmitted after a first one of the two or more secondary content item requests and before a second acknowledgement is received for the first one of the two or more secondary content item requests over the connection path;

means for receiving the second acknowledgement for at least the first one of the two or more secondary content item requests over the connection path after transmitting the second one of the two or more secondary content item requests; and

means for receiving at least one of the two or more secondary content items using the second protocol,

wherein the means for transmitting the primary content item request transmits the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and

wherein the means for transmitting the two or more secondary content item requests transmits the two or more secondary content item requests with another packet header.

11. A device, comprising: a memory; at least one processor coupled to the memory, and a communication module, comprising a transmitter and a receiver, coupled to the at least one processor and/or the memory, wherein the communication module is operable for:

transmitting a primary content item request to obtain a primary content item using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request; and receiving the primary content item using the first protocol;

wherein the at least one processor and the memory are operable to execute a content module operable for generating two or more secondary content item requests for two or more secondary content items associated with the primary content item; and wherein the communication module is further operable for:

receiving the second acknowledgement for at least the first one of the two or more secondary content item requests

20

over the connection path after transmitting the second one of the two or more secondary content item requests; and

transmitting the two or more secondary content item requests using a second protocol and through a connection path, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests and wherein the two or more secondary content item requests are transmitted in series through the connection path such that a second one of the two or more secondary content item requests is transmitted after a first one of the two or more secondary content item requests and before a second acknowledgement is received for the first one of the two or more secondary content item requests over the connection path;

receiving at least one of the two or more secondary content items using the second protocol, wherein the communication module is operable for:

transmitting the primary content item request, with a packet, header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content, item request, and wherein the packet, header defines which connection path is used for communicating the primary content item request; and transmitting the two or more secondary content item requests with another packet header.

12. The device of claim 11, wherein the connection path is a TCP connection, and wherein the second protocol allows a plurality of the two or more secondary content item requests to be transmitted before one of the corresponding acknowledgements for any of the two or more secondary content item requests is received.

13. The device of claim 11, wherein the second protocol uses a transaction identifier to associate each secondary content item request with a corresponding acknowledgement of receipt of the secondary content item request.

14. The device of claim 11, wherein the communication module is further operable for:

receiving the primary content item request from a web browser associated with the device using the first protocol; and

receiving a request for at least one of two or more secondary content items from the web browser;

wherein the content module is further operable for obtaining the requested at least one of the two or more secondary content item content items from the received two or more secondary content items; and

wherein the communication module is further operable for transmitting the obtained at least one of the two or more secondary content items to the web browser using the first protocol.

15. The device of claim 11, wherein the content module is further operable for:

determining if any of the two or more secondary content items is stored on the device; and

wherein the generating of the two or more secondary content item requests is for each of the two or more secondary content items determined to be not stored on the device.

16. The device of claim 11, wherein the first protocol includes a Hypertext Transfer Protocol (HTTP), wherein the primary content item request is transmitted through a TCP connection using the HTTP; and wherein the HTTP does not allow a subsequent content request to be transmitted through

21

the TCP connection until the acknowledgement for the transmitted primary content item request is received.

17. The device of claim 11, wherein the primary content item includes a main web page, and wherein the two or more secondary content items include objects accessible through the main web page.

18. The device of claim 11, wherein the primary content item request further includes instructions for a proxy server to obtain the primary content item from a specified web server.

19. A method of obtaining content for a device with reduced access times, the method comprising:

receiving a primary content item request, from the device, for a web server, using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;

transmitting, to the device, the acknowledgement of receipt of the primary content item request;

obtaining the requested primary content item from the web server using the first protocol;

transmitting the obtained primary content item to the device using the first protocol;

receiving, from the device, two or more secondary content item requests using a second protocol, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, and wherein the two or more secondary content item requests are received in series through a connection path such that a second one of the two or more secondary content item requests is received after a first one of the two or more secondary content item requests from the device and before transmitting a second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path;

obtaining at least one of the two or more requested secondary content items corresponding to the two or more secondary content item requests, from the web server using the first protocol;

transmitting the obtained at least one of the two or more secondary content items using the second protocol to the device through the connection path; and

transmitting the second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path after transmitting the obtained at least one of the two or more secondary content items to the device,

wherein the receiving the primary content item request further comprises receiving the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and

wherein the receiving the two or more secondary content item requests comprises receiving the two or more secondary content item requests with another packet header.

20. The method of claim 19, wherein the connection path is a TCP connection, and wherein the second protocol allows a plurality of the two or more secondary content items to be transmitted before one of the corresponding acknowledgements for any of the two or more secondary content items is received.

22

21. The method of claim 19, wherein the second protocol uses a transaction identifier to associate each secondary content item request with a corresponding acknowledgement of receipt of the secondary content item request.

22. The method of claim 19, wherein the first protocol includes a Hypertext Transfer Protocol (HTTP), wherein the primary content item request is transmitted through a TCP connection using the HTTP, and wherein the HTTP does not allow a subsequent content request to be transmitted through the TCP connection until the acknowledgement for the transmitted primary content item request is received.

23. The method of claim 19, wherein the primary content item includes a main web page, and wherein the two or more secondary content items include objects accessible through the main web page.

24. The method of claim 19,

wherein the transmitting the primary content item request or the two or more secondary content item requests further comprises transmitting the primary content item request or the two or more secondary content item requests to the IP address for the specified web server; and

wherein transmitting the obtained content item further comprises using the transaction identifier to identify the connection path over which the primary content item request or the two or more secondary content item requests were received.

25. A non-transitory computer-readable medium comprising computer-executable code for obtaining content for a device with reduced access times, the code comprising:

code for obtaining, a requested primary content item from a web server using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;

code for transmitting the acknowledgement of receipt of the primary content item request;

code for transmitting the obtained primary content item to the device using the first protocol;

for obtaining at least one of two or more requested secondary content items corresponding to the two or more secondary content item requests from the web server using a second protocol, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, and wherein the two or more secondary content item requests are obtained in series through a connection path such that a second one of the two or more secondary content item requests is obtained after a first one of the two or more secondary content item requests from the device and before transmitting a second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path;

code for obtaining at least one of the two or more requested secondary content items corresponding to the two or more secondary content item requests, from the web server using the first protocol;

code for transmitting the obtained at least one of the two or more secondary content items using the second protocol to the device through the connection path; and

code for transmitting an acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path after transmitting the obtained at least one of the two or more secondary content items to the device,

23

wherein the code for receiving the primary content item request receives the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and

wherein the code for receiving the two or more secondary content item requests receives the two or more secondary content item requests with another packet header.

26. An apparatus, comprising:

means for receiving a primary content item request, from a device, for a web server, using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;

means for transmitting the acknowledgement of receipt of the primary content item request;

means for obtaining the requested primary content item from the web server using the first protocol;

means for transmitting the obtained primary content item to the device using the first protocol;

means for receiving, from the device, two or more secondary content item requests using a second protocol, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, wherein the two or more secondary content item requests are received in series through a connection path such that a second one of the two or more secondary content item requests is received after a first one of the two or more secondary content item requests from the device and before transmitting a second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path;

means for obtaining at least one of the two or more requested secondary content items corresponding to the two or more secondary content item requests, from the web server using the first protocol;

means for transmitting the obtained at least one of the two or more secondary content items using the second protocol to the device through connection path; and

means for transmitting the second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path after transmitting the obtained at least one of the two or more secondary content items to the device,

wherein the means for receiving the primary content item request receives the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and

wherein the means for receiving the two or more secondary content item requests receives the two or more secondary content item requests with another packet header.

27. An apparatus, comprising:

a memory; at least one processor coupled to the memory, and

a communication module, comprising a transmitter and a receiver, coupled to the at least one processor and/or the memory, wherein the communication module is operable for:

24

receiving a primary content item request, from a device, for a web server, using a first protocol, wherein the first protocol couples the primary content item request with an acknowledgement of receipt of the primary content item request;

transmitting the acknowledgement of receipt of the primary content item request;

obtaining the requested primary content item from the web server using the first protocol;

transmitting the obtained primary content item to the device using the first protocol;

receiving, from the device, two or more secondary content item requests using a second protocol, wherein the second protocol decouples the two or more secondary content item requests from corresponding acknowledgements of receipt of the two or more secondary content item requests, wherein the two or more secondary content item requests are received in series through a connection path such that a second one of the two or more secondary content item requests is received after a first one of the two or more secondary content item requests from the device and before transmitting a second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path;

obtaining at least one of the two or more requested secondary content items corresponding to the two or more secondary content item requests, from the web server using the first protocol;

transmitting the obtained at least one of the two or more secondary content items using the second protocol to the device through the connection path; and

transmitting the second acknowledgement of receiving the first one of the two or more secondary content item requests over the connection path after transmitting the obtained at least one of the two or more secondary content items to the device, wherein the communication module is further operable for:

receiving the primary content item request with a packet header, wherein the packet header includes an IP address for a specified web server and a transaction identifier identifying the primary content item request, and wherein the packet header defines which connection path is used for communicating the primary content item request, and receiving the two or more secondary content item requests with another packet header.

28. The apparatus of claim 27, wherein the connection path is a TCP connection, and wherein the second protocol allows a plurality of the two or more secondary content items to be transmitted before one of the corresponding acknowledgements for any of the two or more secondary content items is received.

29. The apparatus of claim 27, wherein the second protocol uses a transaction identifier to associate each secondary content item request with a corresponding acknowledgement of receipt of the secondary content item request.

30. The apparatus of claim 27, wherein the first protocol includes a Hypertext Transfer Protocol (HTTP), wherein the primary content item request is transmitted through a TCP connection using the HTTP, and wherein the HTTP does not allow a subsequent content request to be transmitted through the TCP connection until the acknowledgement for the transmitted primary content item request is received.

31. The apparatus of claim 27, wherein the primary content item includes a main web page, and wherein the two or more secondary content items include objects accessible through the main web page.

25

32. The apparatus of claim **27**, wherein the communication module is further operable for:

transmitting the primary content item request or the two or more secondary content item requests to the IP address for the specified web server, and

using the transaction identifier to identify the connection path over which the primary content item request or the two or more secondary content item requests were received.

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5
10

26